Exhibit 49

BRIEF PREPARED BY THE COAL DIVISION, CANADIAN INSTITUTE OF MINING AND METALLURGY, FOR PRESENTATION TO THE ROYAL COMMISSION ON COAL (1959).

INTRODUCTION

On December 3, 1959, Mr. I. C. Rand, The Commissioner, Royal Commission on Coal (1959), invited The Canadian Institute of Mining and Metallurgy to present the views of the organization concerning the Canadian coal industry. The invitation was transmitted to the Coal Division of the Institute which is pleased to take this opportunity to express its views.

HISTORY AND OBJECTIVES OF THE CANADIAN INSTITUTE OF MINING AND METALLURGY

In 1898 an earlier association known as the Federated Mining Institute was organized as the Canadian Mining Institute. In 1918 an affiliation was agreed between the Institute and the Mining Society of Nova Scotia, which is the oldest mineral industry society in Canada. In 1920 the name of the Institute was changed from the Canadian Mining Institute to its present form - The Canadian Institute of Mining and Metallurgy.

The Canadian Institute of Mining and Metallurgy serves the mineral industry as an association of professional men. The principal objective is to provide means of communicating results of experience and new ideas that are beneficial to promoting progress in technology. The regular meetings of the Institute furnish useful forums for discussion.

ORGANIZATION OF THE INSTITUTE

Under the patronage of the Governor General of Canada, and the Prime Minister of Canada, the Institute is headed by an annually-elected president, assisted by six vice-presidents each of whom represents a geographical district of Canada. Each such district have five councillors. A permanent headquarter's staff is located in Montreal, headed by the Secretary-Treasurer of the Institute.

Technically, the Institute is divided into six divisions, namely: the Coal, Geology, Industrial Minerals, Metallurgy, Metal Mining and Petroleum and Natural Gas Divisions. Each Division is headed by an annually-elected chairman, whose function is to co-ordinate the efforts of committees appointed to promote technical studies, and the preparation of reports for annual meetings of the Institute. Liaison is encouraged between the six technical divisions on studies of common interest.

Standing committees of the Institute are appointed to deal with matters of overall concern such as finance, library facilities, publications, enrolments, education for the mineral industry and awards of Institute honours.

With regard to co-operation with other technical organizations an effective liaison had been established with the American Institute of Mining, Metallurgical and Petroleum Engineers through interchange of certain officers of the Coal Division. The Institute also maintains close relationship with other Canadian Technical Societies and appoints representatives to the Commonwealth Council of Mining and Metallurgical Institutions.

COAL DIVISION, CANADIAN INSTITUTE OF MINING AND METALLURGY

The Coal Division was formed in 1944 as one of the integral technical divisions of the Institute, as it was thought that the Canadian coal industry would be better served by an all-embracing group in the light of the specialized nature of the production and utilization fields of the coal industry.

When the Coal Division was established, specialist committees on mining methods, ventilation, transportation, preparation and legislation were formed for studying technical problems of the industry. In 1950 this divisional organization was streamlined into two technical committees, one dealing with current mining developments in relation to production, and the other with research in the preparation and utilization fields. The latter committee has been in existence since the formation of the Division in 1944.

The accomplishments of the Coal Division and the Mining Society of Nova Scotia reflect the vigour of the industry and are demonstrated by the number of papers on coal subjects published in the Monthly Bulletin of the Institute and in the Yearly Transactions. During the fifteen year period, 1930 to 1944 inclusive, prior to the formation of the Coal Division, there were 63 papers published on coal subjects. From 1945 to date, a total of 150 papers have been published. Some of the papers were presented at special symposiums and forums sponsored by the Coal Division, such as:-

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Domestic Heating Forum. Calgary, October 1951.

Western Canada and Canadian Energy. Winnipeg, October 1952.

Forum on the Automatic Burning of Coal. Winnipeg, October 1952.

The Role of Minerals in the Industrialization of Western Canada. Edmonton, April 1953.

Problems Relating to Ground Stress. Montreal, April 1954.

Ground Stress Symposium. Quebec City, April 1956.

Rock Pressure Studies in the Mines at Springhill, N.S. Presented to Mining Society of Nova Scotia, July 1956.

Joint Solid Fuels Conference of A.S.M.E., A.I.M.E. and C.I.M. Quebec City, 1957.

Ground Stress Studies in Coal Mines of Western Canada. Vancouver, April 1958.

Iron and Steel in Western Canada. Edmonton, September 1959.

Forum on Mine Dusts. Winnipeg, September 1959.

VIEWS ON THE CANADIAN COAL INDUSTRY

It is the considered opinion of the Coal Division, C.I.M., that the Canadian coal industry is a progressive industry, and that the skills of managements and individual engineers are in no way inferior to those in other countries. A convenient though approximate way to judge performance is to compare the average productivities achieved in different coal producing regions operating under reasonably comparable conditions. Productivity is here defined as the number of tons of coal produced per man-shift employed and, when comparing different countries, care has been taken to convert metric and long tons to short tons. By and large, Canadian underground conditions resemble more closely those of Europe than they do those of the United States. For example, conditions in Nova Scotia can be compared with those of undersea mining operations in the United Kingdom, and conditions in the Western Canadian bituminous mines are comparable with those of central France. Productivities in these two European countries are presently about one-half that of the Nova Scotian average of 2-2/3 tons per man-shift, and about a third of the average productivity (4 tons) achieved in the Western Canadian bituminous mines.

It is true that productivities are much higher in the United States, but underground mining is usually conducted at shallower depths and on more regular seams than is the case in Canada. Where mining conditions in the United States approximate those found in Canada, the productivity figures in the United States are much closer to those of the Canadian mines. For example, the underground operations in the Pennsylvania anthracite fields have a productivity of about 3 tons per man-shift, and in Washington State the productivity is approximately 5 tons per man-shift. In the case of strip mining operations, where conditions allow of complete mechanization, the Canadian and United States productivities are nearly the same. For instance, the productivity of the Saskatchewan strip mines is approximately 26 tons per man-shift, and for Indiana and Illinois it is about $27\frac{1}{2}$ tons.

RECOMMENDATIONS

The difficulties of the Canadian coal industry are largely due to economic factors rather than backwardness of the industry and, should it go out of existence, there would be not only regional distress but a tendency toward rising prices of alternate fuels, particularly imported coal and oil.

The Canadian Institute of Mining and Metallurgy therefore recommends:

1. That serious consideration should be given and a careful examination made of any act or influence contemplated for introduction into the Canadian coal mining industry.

2. That research be encouraged, both in private industry and government laboratories, to provide opportunities for competent engineers and scientists to conduct research on problems of production, beneficiation and utilization of Canadian coals. This would also maintain a nucleus of Canadian skill to deal with the problems of an industry faced with severe competition from other forms of energy.

3. That some research, at the graduate level in coal science and technology, be promoted and supported at Canadian universities by providing grants-in-aid, administered by the Department of Mines and Technical Surveys.

4. That steps be taken to establish reasonable co-operation and collaboration with coal research authorities in United States so as to increase the over-all effort and avoid duplication.

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